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branchus from Portage Lake, near Lake Superior. He had had them in his possession since December, 1856, and from that time until the succeeding June they took no food. At the present time they devour earth-worms greedily. During the past winter, the water in which they were kept had repeatedly been frozen solid. They were pumped up from the lake, and it is only during the winter season that specimens are obtained.

Professor Horsford gave the results of several experiments by his pupils to determine the commercial value of saltpetre by a new method proposed by himself some time since, and then announced to the Academy. The results corresponded very accurately with each other, and with those obtained by more elaborate chemical processes.

Four hundred and forty-fifth meeting.

December 8, 1857. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read a letter from Professor Edward Robinson, accepting the Fellowship of the Academy.

Professor Agassiz spoke of the various existing systems of Classification of Fishes, characterizing them all as incomplete and artificial. He analyzed those of anatomists and zoölogists, showing how each failed to conform to the natural system. He referred to his own proposed classification, based on the characters of the scales, and said that he had given that up also as too artificial. The true indications, he thought, were to be found in the embryonic development of this class of animals. Development without an amnios or allantois is common, he said, to naked reptiles and fishes. The scaly reptiles, birds, and mammals are associated by their circulation as a natural group. Among fishes he recognized four groups on a par with the natural divisions of amphibians. He proposed the name of Salachians, to include the sharks and skates, which differ in the structure of their skeletons, brains, and in other particulars, from fishes proper. Next come the genuine Ganoids, with their reptilian affinities. The lamprey-eel is the only type which undergoes a metamorphosis in passing from the young to the adult condition. The four classes, then, among fishes are the Selachians, the Ganoids, Fishes proper, and Myzonts. Professor Agassiz explained how the position of the fins cannot be relied on as a character for the formation of natural groups. The sturgeons, loricarians, and cat-fish, he said, form a natural group, based on similarity of structure of the operculum and upper jaw, characters which he considered of more importance than the muscular bulbus of the aorta. These families are linked together also by the peculiar arrangement of the lateral line and the dorsal and abdominal shields.

Professor C. C. Felton announced the decease of a distinguished Associate Fellow of the Academy, Thomas Crawford, as follows: —

"I rise to announce the death of a Fellow of this Society, Thomas Crawford, the American sculptor.

"It is but a year since Mr. Crawford returned to Rome from a visit to the United States, leaving his family with their relatives. He was then apparently in full health, in the highest spirits, looking forward to future achievements; — already possessed of fame and fortune, domestic happiness, the love and admiration of friends, and of all else that makes the present delightful, and the prospect of the future brilliant and enchanting to a noble spirit. It is but a few days since his colossal bronze statue of Washington was landed at Richmond, and drawn by shouting and enthusiastic multitudes to the place of its destination, up the Capitol Hill of that beautiful city. Last Saturday the lifeless body of the great artist was borne by the pious hands of silent and sorrowing friends, to its final resting-place in Greenwood Cemetery.

"Thomas Crawford was born in New York, on the 22d of March, 1813. Early in life he showed, amidst the hardships of poverty, the irresistible promptings of a natural genius for sculpture, in which he was destined to gain a world-wide renown. In 1835 he was enabled to go to Rome, the true school for the sculptor, and there, with hopeful courage and manly heart, he dedicated his studious nights and laborious days, under the wise counsel and friendly aid of the great Thorwaldsen, to the simplest but sublimest of the arts. His earliest productions gave ample promise of future distinction. In 1839 Mr. Charles Sumner, then visiting Rome, saw the model of the Orpheus, and, admiring its chaste and classic beauty, undertook, with friendly zeal, to raise a subscription in Boston, that the work might be executed in marble. He was successful, and the Orpheus of Crawford is now one of the conspicuous ornaments of the gallery of the Boston Athenæum, and its rare merit established the fame of the young sculptor. In 1844 he returned to the United States, and was married to Miss Louisa Ward of New York. I need not dwell on the happiness which this marriage secured to him.

" The reputation of the artist increased, with the rapidly increasing number of his works. This is not the occasion to enumerate them, or to enter upon an elaborate criticism of their various and extraordinary merits. I have spoken of the first, and I have alluded to the last, the colossal monument of Washington, ordered by the patriotic State of Virginia, which remained, in some of its details, uncompleted at the time of his death. That monument will make the Capitol of Richmond a shrine to which the lovers of art will for ever make their pilgrimages, to gaze upon the sculptured form of the greatest of men, embodied by the genius of one of the greatest of modern sculptors.

" Mr. Crawford was a person of generous and manly character. He was bold without rudeness, frank and independent without forgetting the rights of others. In conversation he was animated, intelligent, and instructive. In manners he was unaffected, simple, and hearty. His genius was not only vigorous, but varied and affluent. His imagination was brilliant and fiery, but chaste and disciplined; and his hand was untiring in executing what his mind conceived. He loved to enthusiasm the beauty of Hellenic art, and was an unerring but kindly critic of the productions of the moderns, and of his living contemporaries. He was alike familiar with the boundless treasures of the Vatican and of the Capitol, and with the vast variety of works in the studios of the artists of all nations at Rome. From what I saw and heard of him there, I am sure it will be the verdict of his brethren, that he has hardly left his peer in the Eternal City.

" In 1856 Mr. Crawford came on a visit to the United States; and his friends were struck by the unbroken vigor of his health, and the animation and joy of his discourse. But even then the disease — a cancer on the brain — which closed his life had made some progress unknown to himself. On his return in the autumn to Rome, it soon demanded attention. An examination was made, and an operation was performed by a skilful surgeon, to ascertain precisely the nature of the disease. It was found to be malignant, and probably incurable. He went to Paris, under advice, and the ablest surgeons of that city pronounced the case a hopeless one. But that nothing should remain untried that might hold out the slightest possibility of benefit, he was removed from Paris to London, and placed under the care of a professional man who had made a special study of this class of diseases. It was all in vain. Crawford died on the 10th of October, having borne the protracted agonies of his long illness with the fortitude of a hero and the resignation of a Christian. The consolations of friendship, of domestic love, and of religious faith, surrounded his dying-bed. He calmly arranged all his earthly affairs, and prepared his soul for the last scene; and he departed with the serenity of one who was conscious of a life consecrated to noble pursuits and generous affections, and who felt an unwavering faith and entire submission to the will of God. He has left to his successors an illustrious example; he has bequeathed to his country a renown that ranks him with the great sculptors of ancient Athens and modern Rome; he has left a name which the most distant ages will not let die.

"I move the following resolutions: —

"*Resolved*, That the members of the American Academy of Arts and Sciences have heard with deep regret of the death of their late associate, Thomas Crawford, the distinguished sculptor. In his character they recognize the noblest virtues, and in his works a large contribution to the glory of the American name in one of the highest walks of art. In his death, the country and the world have lost one of the most brilliant men who have done honor to the present age.

"*Resolved*, That the members of this Association sincerely sympathize with the family and friends of the deceased in this their great bereavement; and that a copy of these resolutions be communicated to Mrs. Crawford by the Corresponding Secretary."

The resolutions were unanimously adopted.

Dr. W. F. Channing exhibited photographs, of various sizes, of the late Rev. W. E. Channing, D. D., taken by Whipple from Gambardella's portrait. He also exhibited specimens of Breckenridge bituminous coal from Kentucky, from which paraffine is now manufactured, specimens of which were shown, together with candles made from this substance.

Professor Horsford spoke of certain curious knolls which are found in Western New York after the forests are cut down, and are always indicative of the presence of gypsum. The heat of the sun acting on the soil after the removal of the forests, the gypsum in solution rises by capillary action to sustain the evaporation, and takes on crystalline form as soon as it reaches a point where the water, reduced by evaporation, becomes insufficient to hold it in solution. These crystals, pushing up from below, raise the ground into the form of a knoll, sometimes six or eight feet in diameter, and from one to two feet high. The bed of gypsum is usually found within a few feet of the surface of the ground.

Four hundred and forty-sixth meeting.

January 12, 1858. — MONTHLY MEETING.

The Academy met at the house of the Hon. Thomas G. Cary.

The PRESIDENT in the chair.

Professor Lovering made a communication in regard to the Australian instrument, called the *boomerang*, under the following heads: — 1. Its History and Antiquity. 2. Its Shape. 3. Its Use. 4. Its Mechanical Theory. 5. Its Experimental Illustration. He gave upon the blackboard a simple mathematical analysis, to show why it deviated from the vertical plane, why it retrograded, and at what angle of elevation these effects were at a maximum.

Professor W. B. Rogers made some remarks upon the variations of its movements, in actual practice, from the results of abstract calculation, and the cause of these variations.